

# 气液混合泵(溶气泵)使用说明

Gas-liquid Mixing Pump Instructions



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欢迎使用益顿气液混合泵。现对该泵的特性、管路设置及操作程序简要介绍，请仔细阅读本说明书，在安装和使用中碰到任何疑问，务必咨询本公司售后服务专门人员。Welcome to Edon gas-liquid mixing pump. Now, the characteristics of the pump, piping settings and operating procedures are briefly introduced. Please read this manual carefully. If you encounter any questions during installation and use, be sure to consult the company's after-sales service specialists.

## 一、性能特征 The performance characteristics

① 该泵的原理是边吸水边吸气、泵内加压混合、气液溶解效率高、释放出 20-30 微米的微细气泡。The principle of the pump is to suck water while sucking gas, pressurize the mixing in the pump, and the gas-liquid dissolving efficiency is high, releasing the 20-30 micron fine bubbles.

② 内置本公司溶气泵的气浮装置可以取代增压泵、空压机、大型溶气罐器及释放头等，解决传统工艺运行不稳定及大气泡翻腾，释放头堵塞等问题。The air floatation device with built-in dissolving air pump of this company can replace the booster pump, air compressor, large-scale dissolving gas tanker and releasing head, etc., and solve the problems of unstable operation of traditional technology, large bubble churn, and release of the plug.

③ 用本溶气泵加工臭氧水制取装置可以取代增压泵、各种混合器、大型氧化塔等，溶气效率 80%-100%，比传统文丘里混合器效率要高出三倍左右。The device for processing ozone water with this dissolved gas pump can replace the booster pump, various mixers, and large-scale oxidation towers. The efficiency of the dissolved gas is 80%-100%, which is about three times higher than that of the traditional Venturi mixer.

④ 混合性能稳定、易操作、易维护、低噪音，用途非常广泛，是新型环保设备溶气气浮工艺中的最佳选择。The mixing performance is stable, easy to operate, easy to maintain, low in noise, and widely used. It is the best choice for dissolved air floatation in new environmental protection equipment.

## 二、产品用途 product use

① 臭氧水制取设备(纯净饮用水灭菌保鲜、鱼苗养殖池灭菌消毒、海产品加工灭菌保鲜、污水脱臭脱色、养殖杀菌、医院臭氧水消毒、家用臭氧水消毒、改善 COD、BOD 等) Ozone water preparation equipment (pure drinking water sterilization and preservation, sterilization and disinfection of fish breeding ponds, sterilization and preservation of seafood processing, deodorization and decolorization of sewage, improvement of COD, BOD, etc.)

② 富氧水制取设备(富氧饮用水、密集鱼鳖养殖、水耕栽培、河道增氧等) Equipment for the production of oxygen-enriched water (enriched drinking water, intensive fish breeding, hydroponic cultivation, etc.)

③ 溶气气浮处理及配套其它设备(各种类型气浮装置、VOC 废气处理、工厂粉尘处理、) dissolved air floatation processing equipment (various types of air floatation device)

④ 生化曝气设备(改善 COD、BOD、地下水除铁除锰等) Biochemical aeration equipment (improved COD, BOD, groundwater removal of iron and manganese, etc.)

⑤ 液体与液体的混合 (搅拌混合后加压输送) **Mixing of liquids and liquids (pressure conveying after mixing)**

三、气液混合泵 (溶气泵) 选型时的注意事项 Precautions when selecting gas-liquid mixing pump (dissolved air pump)  
根据气液混合用途，选型时需要注意如下事项 According to the gas-liquid mixed use, the following matters need to be noted when selecting the type:

:

② 如应用于臭氧水加工用途，通常情况下可直接根据水泵的过流水量选型。If used in ozone water processing applications, it is usually possible to directly select the type according to water flow through the pump.

② 在用于溶气气浮等用途时，一般情况下需要根据水质情况考虑回流水的比例（通常在处理水量的 10-50%之间进行选型）。When used in applications such as dissolved air flotation, it is generally necessary to consider the proportion of the return water according to the water quality (usually between 10% and 50% of the treated water).

③ 气液混合泵选型大致参考表：Selection of gas-liquid mixing pump is roughly as follows

规格 Specification		型号 Model	臭氧水制取用途 Ozone water preparation m <sup>3</sup> /hr	溶气气浮用途 Dissolved gas flotation m <sup>3</sup> /hr	
不 锈 钢 材 质 Stainless Steel	电机一体型 Motor integrated type	15EDQS04S	0.5	-----	
	机械密封 Machinery Seal	20 EDQS 04S	1.3	0.9	
	电机通常选用三相 380V: 2P,50Hz/60Hz Three-phase 380V motor is usually used: 2P, 50Hz/60Hz		25 EDQS 07S	2.5	2.0
			32 EDQS 15S	4.8	3.5
			40 EDQS 22S	7.7	6.0
			50 EDQS75S	18	14
			65 EDQS110S	30	25
	进水口径 15-32 的泵可以选用 220V Water inlet diameter 15-25 pump can choose 220V	80 EDQS 185S	55	50	
	联轴器型 Coupling type 机械密封 Machinery Seal 电机通常选用三相 380V: 2P,50Hz/60Hz Three-phase 380V motor is usually used: 2P, 50Hz/60Hz		15EDQLS04S	0.5	-----
			20 EDQLS 04S	1.3	0.9
			25 EDQLS 07S	2.5	2.0
			32 EDQLS 15S	4.8	3.5
			40 EDQLS 22S	7.7	6.0
			50 EDQLS75S	18	14
			65 EDQ LS110S	30	25
			80 EDQLS185S	55	50
也有 220V/440V 电源 There are also 220V/440V power supplies					

注意：1.以上表格中的过流水量未减掉 7-10%的吸氧量。the amount of water flowing in the above table does not deduct 7-10% of inspiratory volume.

2.以上表格中表示的是水泵的大致过流水量。气浮用途一定要根据回流量进行选型。The above table shows the approximate flow rate of the water pump. Air flotation applications must be based on the amount of return water for selection.

3.如果使用防爆电机，参数和上表中相同If using an explosion-proof motor, the parameters are the same as in the above table.

#### 四. 管路安装要求及附属件 Pipeline installation requirements and accessories

##### 1 吸入管路 Suction pipeline

① 吸入管路的直径一般与泵的吸入口径相同或略大。利用负压吸入气体的情况下，吸入管路的直径有时需要细一个等级，但不要过细。The diameter of the suction line is generally the same as the inlet diameter of the pump. In the case of suction gas using negative pressure, the diameter of the suction line sometimes needs to be one grade fine, but not too thin.

② 供水槽的液面低于泵的中心高度时，吸入管路需要安装底阀，以免管内液体倒流。When the liquid level of the water tank is lower than the center height of the pump, the suction line needs to be installed with a bottom valve to avoid backflow of liquid in the tube.

④ 吸入管路需要安装滤网或 Y 形过滤器（60 目），以免液体中的固体物对泵叶轮造成损坏或卡死。The suction line needs to install a filter or Y-shaped filter (60 mesh) to prevent solid objects in the liquid from damaging or jamming the pump impeller.

⑤ 入口管道不宜太长，使泵靠近液体表面，以降低吸入管线上管道的阻抗。减少直角弯头或U形弯头的使用，不要展开凸起的管子，以防止空气阻力造成的气阻和损坏轴密封。The inlet piping should not be too long, so that the pump is close to the liquid surface to reduce the impedance of the piping on the suction line.

Reduce the use of right-angled elbows or U-shaped elbows, and do not deploy raised tubes to prevent air resistance due to air resistance and damage shaft seals.

## 2 排水管路 Drain pipeline

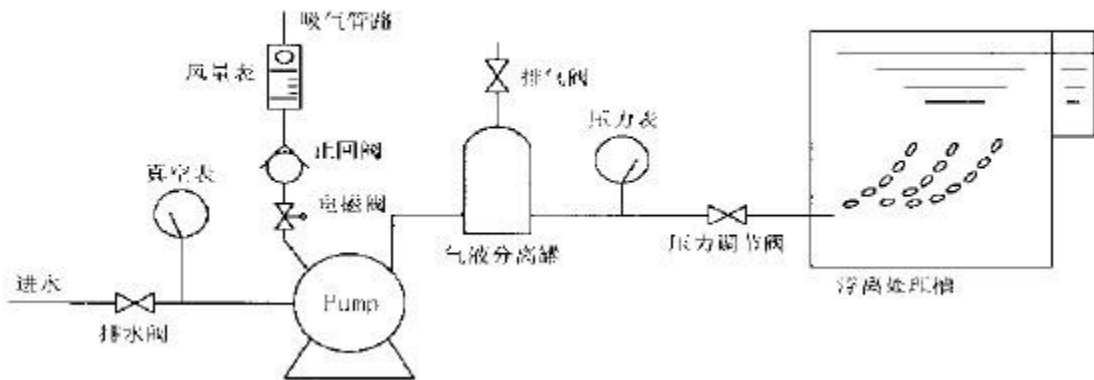
① 排水管路的直径一般与泵的排出口径相同或略大。The diameter of the drain line is generally the same as or slightly smaller than the discharge diameter of the pump.

② 排水管路中需要安装气液分离罐（参照 4 其他附附件），气液分离罐后的管路至压力调节阀门的长度一般为 0.5-1 米。The gas-liquid separation tank (see 4 other accessories) needs to be installed in the drainage line. The length of the pipeline after the gas-liquid separation tank to the pressure control valve is generally 0.5-1 meters.

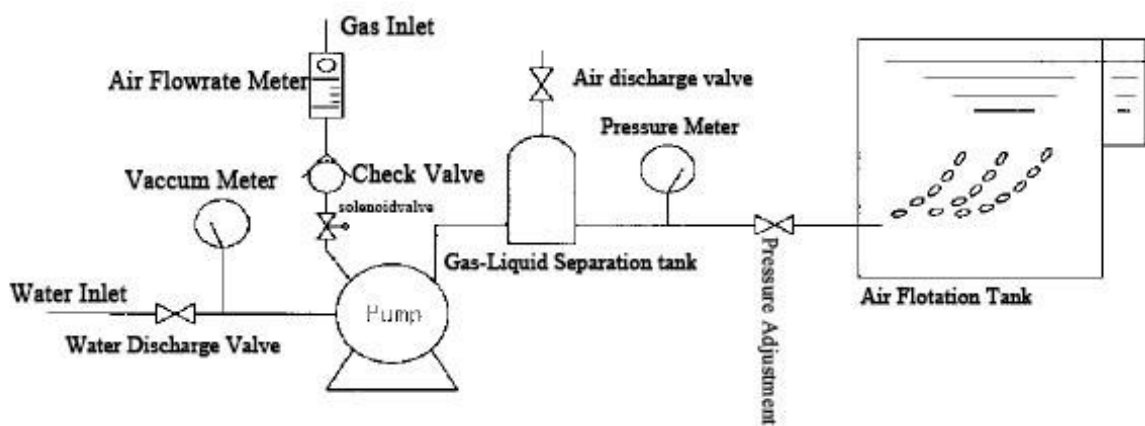
⑥ 压力调节阀门（建议使用截止阀为妥）需设置在排水管路末端（即水处理槽附近）。pressure regulator valve (recommended to use the cut-off valve is appropriate) should be set at the end of the drain line (i.e. near the water treatment tank).

压力调节阀门后面的管路（溶气水释放管路）应尽可能短且直，管径应略大于压力调节阀门口径。Pressure regulating valve the line behind the valve (dissolved water release line) should be as short and straight as possible.

管路示意图



**Pipeline Diagram**



备注 Remarks:

①图中的进水指：在气浮用途时的进水，采用从水处理槽出来的回流水直接进泵。In the figure 1, the influent refers to the inflow of water in the flotation use, using the return water from the water treatment tank directly into the pump.

②图中进气：通常泛指大气中的空气、来自于有起源的氧气和臭氧等气体。In the figure2 Gas Inlet: Generally refers to the air in the atmosphere, gas from oxygen sources such as ozone and ozone.

### 3 溶气水释放管路 Dissolved water release line

1) 臭氧水制取用途通常无需设计溶气水释放管路，因为水泵本身已经对臭氧和水进行充分混合。Ozone water production use usually does not require the design of a dissolved gas water release pipeline, because the water pump itself has been fully mixed with ozone and water.

2) 溶气气浮及其他用途的溶气水释放管路需要根据处理槽的形状等考虑。一般情况下，溶气水释放管路采用以下几种方式：Dissolved air flotation and other uses of dissolved gas water release lines need to be considered based on the shape of the treatment tank. Under normal circumstances, the dissolved gas release pipeline uses the following methods

1. 在圆筒形处理槽的锥形底部直接安装立管，立管应尽量短，管径应大于排水管路直径。立管口朝上。Install the riser directly at the bottom of the cone of the cylindrical processing tank. The riser should be as short as possible. The diameter of the riser should be larger than the diameter of the drain line. The riser is up.

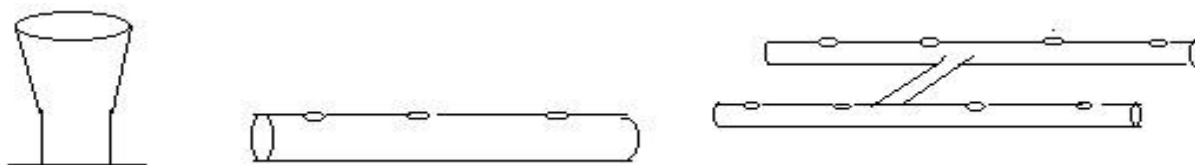
2. 在长方形处理槽的溶气室横放直管，根据直管的长度：The straight pipe is placed horizontally in the dissolving chamber of the rectangular treatment tank, according to the length of the straight pipe:

a 短管直接在末端安装较大口径弯头（弯头必须朝上安装），直接排放溶气水。

The short tube is installed directly at the end with a larger diameter elbow (the elbow must be installed upwards) to discharge the dissolved water directly.

b 长直管每隔 20-30 公分钻 10-15 毫米直径的孔排放溶气水。The long straight pipe with 10-15 mm diameter holes every 20-30 cm to discharge dissolved gas water.

3. 在需要大面积排放溶气水的水槽中（充氧用途等），长直管后接 H 形拼装管并在拼装管上钻孔排放溶气水（参照 2, b）。In sinks requiring large areas for the discharge of dissolved water (oxygen use, etc.), the long straight pipe is followed by an H-shaped assembly pipe and drilled on the assembly pipe to discharge the dissolved gas water (Ref. 2, b).



### 3. 其他附属件 Other accessories

#### 1) 吸气嘴 Suction nozzle

a) 为了保证吸气效果，泵的吸入口处一般需要安装气体吸嘴。气体吸嘴将气体导入泵的叶轮附近，并借助叶轮将气体引入泵的叶片内加压混合。气体吸嘴可以保证气体的稳定吸入和高效溶解。In order to ensure the suction effect, a suction nozzle is usually installed at the suction inlet of the pump. The gas suction nozzle guides the gas to the vicinity of the impeller of the human pump and uses the impeller to introduce the gas into the pump's blade for pressure mixing. Gas nozzles ensure stable gas inhalation and efficient dissolution.

b) 气体吸嘴前需要安装气体流量计，以便调节和控制吸气量。气体流量计与吸气管路之间需要安装开闭阀，这样可以避免每次开启水泵时重新调节吸气流量，同时可以防止关闭水泵时液体倒灌入吸气管路。臭氧水制取用途请在臭氧发生器与吸入管路之间安装单向止回阀+电磁阀，以免臭氧发生器进水损坏。A gas flow meter needs to

be installed before the gas nozzle to adjust and control the intake volume. An on-off valve is required between the gas flow meter and the suction line to avoid re-adjusting the suction flow each time the pump is turned on, and to prevent the liquid from pouring back into the suction line when the pump is turned off. Ozone Water Preparation Use a one-way check valve + solenoid valve between the ozone generator and the suction line to prevent damage to the ozone generator's water.

2) 气液分离罐 Gas-liquid separation tank

- a 注入泵中的气体中，未能溶解的部分会在压力调节阀门前形成气窝，影响溶气效果。所以需要在泵的出口管路中安装气液分离罐。气液分离罐上需要安装自动排气阀。 In the gas injected into the pump, the undissolved part will form a gas pocket in front of the pressure regulating valve, affecting the effect of dissolved gas. Therefore, it is necessary to install a gas-liquid separation tank in the outlet line of the pump. An automatic exhaust valve needs to be installed on the gas-liquid separation tank.
- b 气液分离罐的大小一般根据泵的流量设定，但是为了方便起见根据泵的出口口径设定气液分离罐容量如下： The size of the gas-liquid separation tank is generally set according to the flow rate of the pump, but for the sake of convenience, the capacity of the gas-liquid separation tank is set according to the outlet diameter of the pump as follows:

泵的出口口径 Pump outlet diameter	气液分离罐容量 Gas-liquid separation tank Volume
32mm 以下 Less than	4 升
40mm	8 升
50mm	30 升
65mm	80 升
80mm	150 升

3) 真空表 Vacuum Meter

4) 压力表 Pressure Meter

5 操作与调节 Operation and adjustment

1 初次运转 First run

a 初次运转之前必须在泵内加水，然后将泵的进口阀门及出口阀门全开。将进气阀及压力表关闭后，短暂接通电源。确认泵的旋转方向正确无误之后再进入正式运转。 Before the initial operation, water must be added to the pump, and then the pump inlet valve and outlet valve should be fully opened. After closing the inlet valve and pressure gauge, switch on the power briefly. Confirm that the pump's rotation direction is correct before entering the official operation.

b 逐渐调小进口阀门，直到真空表的负压显示-0.1 kg/cm<sup>2</sup>~-0.3kg/cm<sup>2</sup>,然后开启吸气阀。 Gradually reduce the inlet valve until the vacuum gauge negative pressure shows -0.1 kg/cm<sup>2</sup> ~ -0.3kg/cm<sup>2</sup>, and then open the suction valve.

c 气体在水中的溶解量一般为水流量的 3% (常压时的饱和溶解量)，气液混合泵的气体注入量应该大于饱和溶解量，吸气量建议设定在水流量的 7-8%或不超过 10%。 The dissolved amount of gas in water is generally 3% of the water flow (saturated dissolution at normal pressure). The gas injection volume of the gas-liquid mixing pump should be greater than the saturated dissolved amount, and the inspiratory capacity is recommended to be set at 7-8 of the water flow rate. % or no more than 10%.

d 调节出口压力阀门，直到压力表显示处理系统所需要的压力。出口压力根据用途而有所区别： 臭氧

水制取用途 1.5-2.5 kgf/cm<sup>2</sup>

溶气气浮及其他用途： 3.5-4 kgf/cm<sup>2</sup>

Adjust the outlet pressure valve until the pressure gauge shows the pressure required to handle the

system. Export pressure varies according to use:

Ozone water preparation use 1.5-2.5 kgf/cm<sup>2</sup>

Dissolved air flotation and other uses: 3.5-4 kgf/cm<sup>2</sup>

g 压力高于所需范围对气液混合效果并无明显助益，反而会减少溶气水制取量并增加泵的动力消耗。

对进口阀门、出口阀门及吸气阀门进行微调节，直到取得理想的混合效果。（臭氧水制取用途一般情况下不需要微细气泡；溶气气浮及其他用途需要观察溶气效果[微细气泡的发生状况]）。

停止泵的运转时首先要关闭吸气阀门，待管路中的气体全部排放后关闭泵的动力电源。这样可以避免排水管路中的气水混合物由吸气管倒灌入吸气阀门而造成吸气管路端设备（臭氧发生器或控制仪器）的损坏。

f Pressure above the required range does not contribute significantly to the gas-liquid mixing effect, but rather reduces the amount of dissolved gas water produced and increases the power consumption of the pump.

Fine-adjust the inlet valve, outlet valve and suction valve until the desired mixing effect is achieved. (Ozone water preparation use does not require microbubbles in general; dissolved air flotation and other applications require observing the dissolved gas effect [the occurrence of fine air bubbles]).

To stop the operation of the pump, first close the suction valve, and then turn off the pump after all the gas in the pipeline is discharged. This can prevent the gas-water mixture in the drain line from being sucked into the suction valve by the suction pipe and cause damage to the suction line end equipment (ozone generator or control instrument).

## 2 日常运转 Daily operation

- 初次运转时一旦设定了合适的使用条件（真空度、压力）并达到预期效果，日常运转时一般无须需对进口阀和出口阀进行频繁调整。为了便于操作，可以在进口阀前和出口阀后各安装一个球阀之类的关闭阀门，以便平时的操作或维护时使用。Once the proper operating conditions (vacuum, pressure) have been set and the desired results have been achieved during the initial operation, frequent adjustments to the inlet and outlet valves are generally not required during daily operation. In order to facilitate the operation, a closing valve such as a ball valve may be installed in front of the inlet valve and behind the outlet valve, so that it can be used during normal operation or maintenance.
- 必须注意的是，接通泵的动力电源后再打开吸气阀门（自动控制的情况下需要安装延时开关）。It must be noted that the suction valve is switched on after switching on the pump (in the case of automatic control, a delay switch must be installed).
- 停止泵的运转时请参 1 初次运转最后一项。When stopping the operation of the pump, please refer to the first operation of the last item.

## 3 Maintenance 维护

- 维修泵时务必关闭电源Always turn off the power when servicing the pump!
- 日常检查：压力、振动、噪音等，如有较大异常，应立即停泵检修，以免发生事故；轴承允许温升不超过 80° C；如螺钉松动，必须停泵 Daily inspection: pressure, vibration, noise, etc. If there is a large abnormality, the pump should be immediately stopped for inspection and maintenance in order to avoid accidents; the allowable temperature rise of the bearing does not exceed 80°C; if the screw is loose, the pump must be stopped.
- 长期停泵维护：冬季停用时，一定要进行保温处理或将泵内的水排干，防止泵壳冻结，备用泵定期运行。Long-term shutdown pump maintenance: When the winter is out of service, be sure to do insulation treatment or drain the water in the pump to prevent the pump casing from being frozen and the spare pump to run regularly.

## 拆卸和组装 Disassembly and assembly

按照以下步骤拆解和组装： Follow the procedure below to disassemble and assemble:

### 1 拆卸 Disassembly

- 1) 拆下泵盖螺栓，拆下泵盖 Remove the pump cover bolt and remove the pump cover;
- 2) 松开叶轮固定螺钉，从泵轴上拆下叶轮。如果叶轮拆卸困难，拧入叶轮上的两个螺孔，拔出叶轮； Loosen the impeller set screw and remove the impeller from the pump shaft. If the impeller is difficult to remove, screw in the two screw holes on the impeller and pull the impeller out;
- 3) 从泵轴上取下平键，擦去固定标记； Remove the flat key from the pump shaft, wipe off the fixed mark;
- 4) 拆下机械密封圈； Remove the mechanical seal ring;
- 5) 拆下将泵体固定至电机法兰（泵法兰）的螺栓，然后拆下泵体。机械密封的静环可以与泵体一起拆下。注意不要刮伤密封摩擦面。 Remove the bolts that secure the pump body to the motor flange (pump flange) and remove the pump body. The static ring of the mechanical seal can be removed together with the pump body. Please be careful not to scratch the seal friction surface.。

### 2. 装配 Assembly

装配步骤与拆解步骤相反，但请注意以下几点： The assembly procedure is the reverse of the disassembly procedure, but note the following:

- 1) 机械密封摩擦面应用干净、柔软的布清洁，注意不要刮伤摩擦面； The friction surface of the mechanical seal should be cleaned with a clean, soft cloth, taking care not to scratch the friction surface;
- 2) 叶轮应安装在泵体和泵盖之间。此外，在拆卸泵轴之前，应将泵轴上的固定标记擦掉。叶轮与泵体的间隙调整如下：将叶轮安装在轴上，朝泵体方向推，直至与泵体接触，轻轻拧紧叶轮定位螺钉，轻敲泵轴顶部，利用其反弹力。移动叶轮。间隙正确后，安装泵盖并转动泵轴。如果泵轴转动自如，可以拧紧叶轮安装螺栓。 The impeller should be installed between the pump body and the pump cover. In addition, the fixed marks on the pump shaft should be wiped off before disassembling. The clearance between the impeller and the pump body is adjusted as follows: Install the impeller on the shaft and push it toward the pump body until it touches the pump body, gently tighten the impeller set screw, and tap gently on the top of the pump shaft to use its rebound force. Move the impeller. After the clearance is correct, install the pump cover and turn the pump shaft. If the pump shaft is easily and smoothly rotated, the impeller mounting bolts can be tightened.
- 3) 更换 O 形圈。垫片 Replace O-ring. Gasket
- 4) 更换各种磨损件 Replace various worn parts
- 5) 螺栓必须对称拧紧，不得相互拧紧。 The bolts must be tightened symmetrically, do not tighten one on the other

## 6. 故障、原因及对策 Faults, Causes and Countermeasures

症状 Symptom	原因 Causes	对策 Countermeasures
不吸气 Do not inhale	<ul style="list-style-type: none"><li>●吸气管路阀门未开 Suction line valve not open</li><li>●吸气管路未调出负压（真空） Suction line does not set negative pressure (vacuum)</li></ul>	<ul style="list-style-type: none"><li>●打开吸气管路的开闭阀 Open the suction valve opening and closing valve</li><li>●逐渐调小吸水管路阀门，直到真空表显示负压（吸气管路进口可以感觉到吸气） Gradually adjust the suction line valve until the vacuum gauge shows negative pressure (intake can be</li></ul>



		felt at the suction line inlet)
大气泡过多 Excessive big bubbles	<ul style="list-style-type: none"> <li>● 出口管路压力不足 Insufficient outlet line pressure</li> <li>● 吸气量过多影响溶气效果 Inspiratory excess affects the effect of dissolved air</li> <li>● 进口管路、阀门接口或排水管路、阀门接口漏气 Leakage of inlet piping, valve interfaces or drain lines, and valve connections</li> <li>● 释放管路问题：弯头过多、释放口朝下、释放管路过长且未打孔 Releasing the line Problem: Excessive elbow, release port down, release line too long and not punched</li> <li>● 出口管路的压力调节阀与水处理槽之间距离过长、弯头过多、管路阀门种类不对（球阀、针阀等） The distance between the pressure regulating valve of the outlet pipe and the water treatment tank is too long, the elbow is too much, and the type of pipeline valve is not correct (ball valve, needle valve, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>● 逐渐调小排水管路压力调节阀，直到压力表显示需要设定的系统压力 Gradually reduce the pressure regulator of the drain line until the pressure gauge shows the system pressure to be set</li> <li>● 逐渐调小吸气量并确认溶气效果 调节气液分离罐上的自动排气阀，适当排放大气泡 Gradually reduce suction volume and confirm dissolved gas effect. Adjust the automatic exhaust valve on the gas-liquid separation tank and discharge large bubbles properly</li> <li>● 紧固所有管路、阀门接口，确认密封效果 Fasten all piping and valve connections to confirm sealing effect</li> <li>● 将弯头减少到最低限度、释放口朝上安装、在管路上钻孔 Minimize the elbow, install the discharge port upward, drill the pipe</li> <li>● 将排水管路阀门移到水处理槽附近、将弯头减少到最低限度、使用截止阀或闸阀 Move drainage line valve near water treatment tank, minimize elbow, use stop valve or gate valve</li> </ul>
溶气效果不稳定 Dissolved gas effect is unstable	<ul style="list-style-type: none"> <li>● 排水管路被大气泡堵塞 Drainage line blocked by large bubbles</li> </ul>	<ul style="list-style-type: none"> <li>● 调节气液分离罐上的自动排气阀，适当排放大气泡 Adjust the automatic exhaust valve on the gas-liquid separation tank and discharge large bubbles properly</li> </ul>
电机不转 Motor does not turn	<ul style="list-style-type: none"> <li>● 未接通电源 Unpowered</li> <li>● 泵内进入异物卡住泵叶轮 Foreign matter in the pump stuck in the pump impeller</li> <li>● 电机烧毁 Motor burned</li> </ul>	<ul style="list-style-type: none"> <li>● 接通电源 Power on</li> <li>● 打开泵盖清除异物，更换叶轮或轴封 Open the pump cover to remove foreign matter, replace the impeller or shaft seal</li> <li>● 更换电机 Replace motor</li> </ul>
泵轴处漏水 Water leakage at the pump shaft	<ul style="list-style-type: none"> <li>● 机械密封损坏 Damaged mechanical seal</li> <li>● 填料密封漏水超过允许范围 Packing seal leakage exceeds allowable range</li> </ul>	<ul style="list-style-type: none"> <li>● 更换机械密封 Replace mechanical seal</li> <li>● 适当旋紧填料密封压环螺栓 如果填料密封损坏则须更换 Properly tighten packing seal bolt. Please change it with a new one if the original one is broken.</li> </ul>
噪音过大 Excessive noise	<ul style="list-style-type: none"> <li>● 电机轴承磨损 Motor bearing wear</li> <li>● 叶轮磨损 Impeller rubbed</li> </ul>	<ul style="list-style-type: none"> <li>● 更换轴承或电机 Replace bearing or motor</li> <li>● 重新安装或送厂家修理 Reinstall or send it to the manufacturer to repair</li> </ul>
不出水或出水不足 The water starts out but it doesn't come out immediately	<ul style="list-style-type: none"> <li>● 出水不足 Insufficient water</li> <li>● 吸程过高 Suction lift is too high</li> <li>● 混有空气 Inhalation of air</li> </ul>	<ul style="list-style-type: none"> <li>● 灌满水 Fill water</li> <li>● 降低泵安装位置 Reduce the pump installation position</li> <li>● 检查吸入管和密封件是否泄漏 Check the suction line and seal for leaks</li> </ul>